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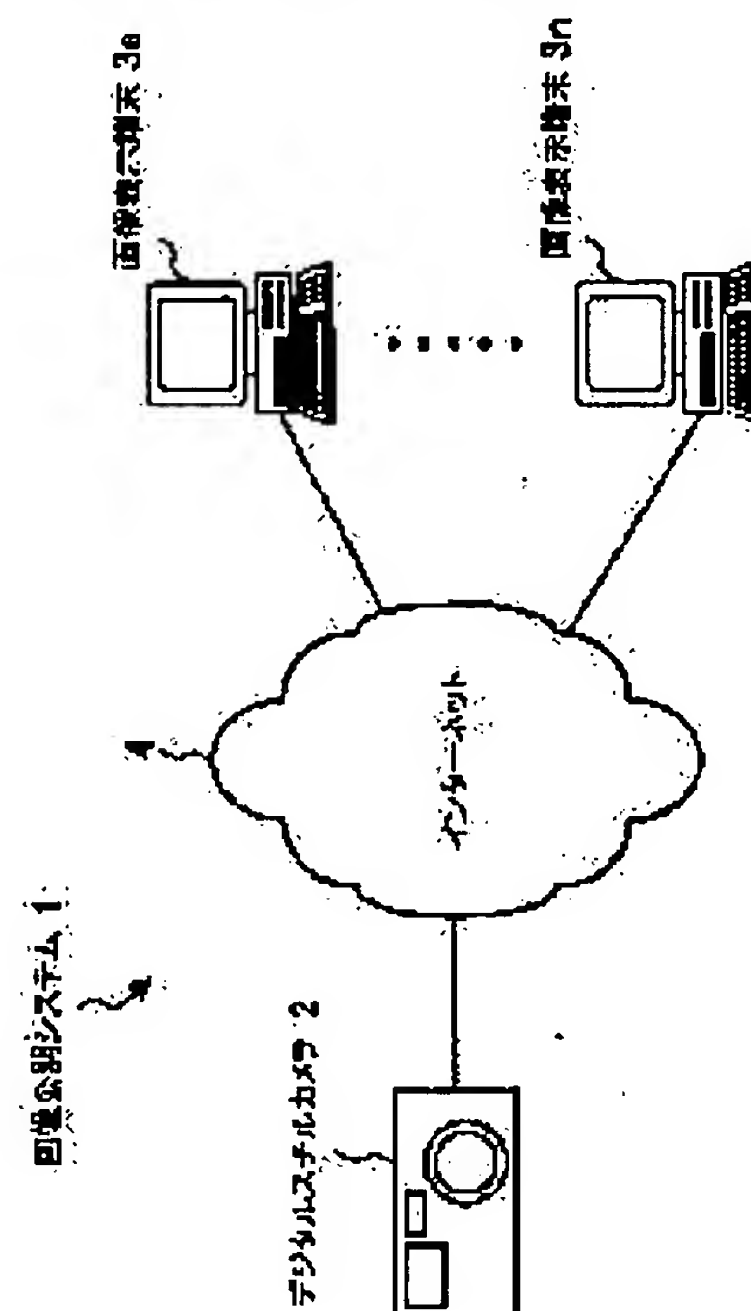
(54) IMAGING DEVICE AND IMAGE RECORDING AND REPRODUCING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an imaging device capable of easily releasing image data through a network.

SOLUTION: A digital still camera 2 and image display terminals 3a to 3n are connected to the Internet 4 and respectively hold an IP address. The digital still camera 2 images an image, functions to record the imaged image as digital image data in a memory card and also functions as an image releasing server for releasing the recorded image data through the Internet 4. If the digital still camera 2 is accessed, for example, from the image display terminal 3a and allows connection on the basis of the IP address, etc., of an access source device extracted from received data, the digital still camera 2

reads prescribed image data from the memory card to transmit the prescribed image data in response to a transmission request from the image display terminal 3a. With the image display device 3a, a user can display and browse the received image data.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image recording regenerative apparatus in which record and playback of the image pick-up equipment which picturizes and records an image, and image data are possible.

[0002]

[Description of the Prior Art] Image pick-up equipments, such as a digital still camera which an image is photoed and can be memorized as digital data in recent years, and a camcorder, have spread. For example, the memory card which is removable small semiconductor memory is made to usually memorize the photoed image data in a digital still camera. Moreover, development of image regeneration equipments, such as memorizable digital VTR (video tape recorder), is also progressing by using as digital data the dynamic image obtained by reception, an external input, etc. of broadcast.

[0003] Moreover, it is also general using networks, such as the Internet, to perform an electronic mail, perusal of a homepage, etc. In the current Internet, although IPv4 (Internet Protocol version 4) is mainly used as a communications protocol, problems, such as lack of an address space, have arisen with the rapid growth of the Internet. Then, maintenance of IPv6 (IP version 6) is advanced as a communications protocol of the next generation which has a 128-bit huge address space.

[0004]

[Problem(s) to be Solved by the Invention] By the way, the demand of wanting to open the image photoed with the above image pick-up equipments to many general users through a network is increasing. In order to exhibit the photoed image through a network conventionally, generally the photoed image data needed to be transmitted to the Network Server. For example, although there is the approach of using a homepage as an approach of exhibiting through the Internet, once transmitting image data to PC (personal computer) etc. from image pick-up equipment in this case, it is necessary to transmit to the WWW (World Wide Web) server which ISP (Internet Service Provider) which offers communication service possesses.

[0005] If the case where it opens to the public on a homepage is explained concretely hereafter, after a memory card memorizes, by using the communication interface which extracted this memory card, and put to PC etc., or was prepared in image pick-up equipment etc., the image data generated by photography by image pick-up equipment will be transmitted in PC, and will be memorized by storage, such as a hard disk. And the data of the HTML (Hypertext Markup Language) format containing the image data which accessed ISP and was photoed through the telephone line etc. from this PC are created, and a WWW server is made to memorize. Thereby, a general user becomes possible [perusing image data in a browser screen] by specifying URL (Uniform Resource Locators), accessing this WWW server, and reading an HTML document.

[0006] Thus, since image data had to be incorporated to PC etc. in order to exhibit the photoed image on a network conventionally, and it had to transmit to the Network Server, by the time the photoed image was exhibited, time and effort and time amount start and were troublesome.

[0007] Moreover, not only image pick-up equipment but when the image data recorded in image recording regenerative apparatus, such as digital VTR, was exhibited through a network, there was instead of [no] in performing data transfer to PC or ISP.

[0008] This invention is made in view of such a technical problem, and it aims at offering the image pick-up equipment which can exhibit image data easily through a network.

[0009]

[Means for Solving the Problem] In the image pick-up equipment which picturizes and records an image in order to solve the above-mentioned technical problem in this invention An image data-logging means to hold an IP address and to record the picturized image as image data of a digital method, If the Request to Send of said image data which connected with the network and was transmitted to said addressing to an IP address through said network is received Said predetermined image data is read from said image data-logging means; and the image pick-up equipment characterized by having an image public presentation server means to transmit through said network is offered.

[0010] It becomes possible to receive direct access from an external device through a network by holding the IP address with such image pick-up equipment, and according to the Request to Send of image data transmitted to addressing to an IP address held with an image public presentation server means, predetermined image data is read from an image data-logging means, and it becomes possible to transmit through a network. Therefore, the image picturized and recorded can be easily exhibited through a network.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. In addition, the example of a gestalt of the following operations explains the case where the image pick-up equipment of this invention is applied to a digital still camera. Drawing 1 is drawing showing the example of a system configuration of the image public presentation system containing a digital still camera.

[0012] The image public presentation system 1 shown in drawing 1 is constituted by two or more video display terminals 3a-3n for displaying the digital still camera 2 which picturizes and records an image, and the image exhibited by the digital still camera 2. A digital still camera 2 and each video display terminals 3a-3n are connected through the Internet 4. This image public presentation system 1 is picturized in a digital still camera 2, and is a system for opening the recorded image data to video display terminals 3a-3n through the Internet 4.

[0013] A digital still camera 2 picturizes a photographic subject, and records a static image on the Lord who picturized as image data of a digital method. This image data is recorded on the memory card which is removable small semiconductor memory, for example. Moreover, a digital still camera 2 has a function as an image public presentation server for exhibiting the recorded image data through the Internet 4.

[0014] Moreover, video display terminals 3a-3n are information processors, such as PC and PDA (Personal Digital Assistants), and possess the function for displaying the required processing facility for communicating with a digital still camera 2 through the Internet 4, and the received image etc.

[0015] These digital still camera 2 and video display terminals 3a-3n are connected with the Internet 4 through communication wires, such as the telephone line and Ethernet (trademark), from ISP which was prepared on the Internet 4 and which is not illustrated in fact. In this case, each equipment possesses the modem for connecting with the telephone line, NIC (Network Interface Card) for connecting with Ethernet, etc. Moreover, when the communications protocol of communication link I/F which a digital still camera 2 possesses, for example differs from the communications protocol for connecting with ISP, the gateway is prepared among these, it is changing a communications protocol and a mutual communication link is attained.

[0016] In this image public presentation system 1, each a digital still camera 2 and video display terminals [3a-3n] equipment holds the IP address based on IPv6. Between each equipment, a communication link is performed according to Internet Protocol (IP), and it becomes possible by specifying the IP address of a transmission place to transmit data to the target transmission place. In

IPv6, a huge address space can be obtained by specifying an IP address as 128-bit data. Thereby, to a digital still camera 2 and video display terminals [3a-3n] each which was installed in domestic, a global IP address can be assigned and the peer to peer communication link between these equipments is attained.

[0017] Therefore, it can be made to function as a server for offering the communication service on the Internet 4 about both a digital still camera 2 or the video display terminals 3a-3n. Moreover, ISP does not need to possess the server ability for offering the communication service on the Internet 4 fundamentally that what is necessary is to offer only the service which makes connection with the communication wire and the Internet 4 which tie each equipment.

[0018] For example, when exhibiting on a homepage the image picturized in the digital still camera 2 using the technique of WWW, WWW server ability can be prepared in the digital still camera 2 instead of ISP. Video display terminals 3a-3n perform the browser program for perusing a homepage, are performing the communication link according to HTTP (Hypertext Transfer Protocol), and become possible [displaying the contents containing the image data offered from a digital still camera 2].

[0019] Thus, in this invention, the picturized image can be operated as an image public presentation server for opening to the public on the Internet 4 by having given the IP address to the digital still camera 2, and having made it possible to carry out direct access from other devices, such as video display terminals 3a-3n. Therefore, the user who picturized the image using the digital still camera 2 becomes possible [opening to the public easily through the Internet 4, without spending time and effort and time amount], without transmitting the recorded image data to the Network Server on devices, such as other PCs, or ISP.

[0020] Next, the example at the time of using a homepage is concretely explained as an approach of exhibiting the image picturized in the digital still camera 2. Drawing 2 is the block diagram showing the example of an internal configuration of the digital still camera 2 in this case.

[0021] As shown in drawing 2, a digital still camera 2 The camera section 21 which picturizes a photographic subject and generates the image data of a digital method, The image recording section 22 which records the generated image data, and the WWW server processing section 23 for exhibiting the picturized image on the Internet 4, It is constituted by communication link I/F (interface)25 for connecting with the display 24 which displays the homepage for exhibiting the image and image which were picturized etc. in the network of Internet 4 grade.

[0022] The camera device sections, such as CCD (Charge Coupled Device) for the camera section 21 to picturize a photographic subject, and a lens, a diaphragm device, The signal-processing section, an image memory, etc. which change the picture signal outputted into digital data, perform various image quality amendment processings and data compressions, and generate the image data of a predetermined data format are provided. While outputting the image data for record to the image recording section 22, the image data for a display to which processing of a data compression etc. is not performed is outputted to a display 24.

[0023] The image recording section 22 is constituted by the reader writer which performs writing to memory card 22a which is removable small semiconductor memory, and read-out, and records the image data outputted from the camera section 21 on memory card 22a, and reads and transmits predetermined image data to the WWW server processing section 23.

[0024] The WWW server processing section 23 memorizes the HTML file which constitutes a homepage, and transmits the HTML file for exhibiting the image which read and picturized image data to the Internet 4 through communication link I/F25 if needed according to the Request to Send which received through communication link I/F25 from the image recording section 22. Moreover, the image data of the homepage constituted by this HTML file is transmitted to a display 24. Furthermore, processing which manages the access hysteresis from other devices through the Internet 4, and processing for restricting access are performed.

[0025] A display 24 displays the picturized image, the image of a homepage, etc. on LCD (liquid crystal display) according to the image data transmitted from the camera section 21 or the WWW server processing section 23.

[0026] It connects with a communication wire from ISP linked to the Internet 4, and communication link I/F25 transmits and receives the data of this communication wire and the WWW server processing section 23. This communication link I/F25 communicates for example, based on USB (Universal Serial Bus) specification. In this case, communication link I/F25 is connected through the gateway which is not illustrated, for example to the telephone line from ISP, or the communication wire by Ethernet. While this gateway possesses the Ethernet adapter for connecting with the modem or Ethernet for connecting with the telephone line, and the I/F section for connecting with the communication wire of USB specification and changes a communication link format The IP address specified through the Internet 4 is recognized, and access to a digital still camera 2 is enabled, and assignment of the IP address by the digital still camera 2 is recognized, and processing for enabling access to the device on the Internet 4 is performed.

[0027] In addition, for example, telecommunications standards, such as wireless LAN and Bluetooth, may be used between this gateway, and it may be made to connect them by wireless without a cable. In this case, communication link I/F25 possesses the antenna for transmitting and receiving data by wireless etc.

[0028] In such a digital still camera 2, when picturizing an image, in the camera device section of the camera section 21, incidence of the light from a photographic subject is carried out to CCD, photo electric conversion is carried out to it, and a picture signal is outputted. After being changed into digital data in the signal-processing section and performing image quality amendment processing of noise reduction etc., this picture signal is changed into the predetermined data format for a display, and is sent out to a display 24. A display 24 displays the image currently picturized on LCD according to the image data which received.

[0029] If record of an image is required [that the shutter carbon button which is not illustrated is pushed in this condition, etc. and], the signal-processing section of the camera section 21 changes the picture signal for one frame at this time into data formats, such as JPEG for record (Joint Photographic coding Experts Group), and sends it out to the image recording section 22. The image recording section 22 makes the image data which received record on the predetermined address in memory card 22a.

[0030] Moreover, by communication link I/F25, when exhibiting the image data picturized and recorded through the Internet 4, if access from video display terminal 3a is received, the WWW server processing section 23 reads a predetermined HTTP file, and sends it out to video display terminal 3a while it permits connection and notifies it to video display terminal 3a. The picturized image can be exhibited to the user of video display terminal 3a by making predetermined image data read from memory card 22a [at this time 22, for example, the image recording section,], and associating and transmitting this image data in a HTTP file. Moreover, the list of the file names of the image data opened to a HTTP file is carried, and you may make it transmit image data by clicking the file name of a video display terminal 3a small lever. For that, CGI (Common Gateway Interface), the clickable map function carried in the browser program by the side of video display terminal 3a are used.

[0031] Here, drawing 3 is drawing showing the example of a screen display in video display terminal 3a which accessed the digital still camera 2. In video display terminal 3a, the browser screen 31 as shown in drawing 3 by performing a browser program is displayed, and if connection with a digital still camera 2 is successful and a HTTP file is received, the homepage screen 32 by the HTTP file which received will be displayed into this browser screen 31. It is displayed as an initial screen immediately after access, and file name 32a of the image data recorded on memory card 22a of a digital still camera 2 is arranged for every items, such as "Mt. Fuji" and "Tokyo Bay", and the homepage screen 32 shown in this drawing 3 is displayed. Moreover, it is shown that it can link to each file name 32a with an underline, and the specified image data can be downloaded and displayed by carrying out click actuation of this file name 32a. Furthermore, the thumbnail image which reduced the display size of the image recorded with file name 32a may be displayed, and you may constitute so that a visitor may understand the contents of the image.

[0032] The HTTP file for constituting a homepage screen 32 like a WWW server processing section 23 small lever from a digital still camera 2 is generated. You may make it for example, memory card 22a's

storage of image data generate this HTTP file automatically in the WWW server processing section 23. Moreover, the homepage screen generated by the HTTP file may be displayed on a display 24, and the WWW server processing section 23 may possess the program which enables edit of the contents of a display according to the input of the user by the actuation input section which is not illustrated. By such approach, the user of a digital still camera 2 becomes possible [generating the open screen of image data easily], without transmitting the picturized image data to other devices, such as PC.

[0033] By the way, since direct continuation is carried out through a device and the Internet 4, such as video display terminals 3a-3n, it will be saved at the WWW server processing section 23, memory card 22a, etc., and the linked HTTP file and image data will be altogether shared between a digital still camera 2 with other connected devices. Then, since unjust access is prevented or only an image to exhibit is transmitted, it is necessary to provide a security means.

[0034] Here, drawing 4 is drawing for explaining notionally the security means in a digital still camera 2. In the digital still camera 2, since the communication link with an external device is performed according to Internet Protocol, when accessed from these devices, the IP address which the device of an accessing agency holds is recorded into the data transmitted from this device. Therefore, in a digital still camera 2, the notified IP address is used as a security means.

[0035] As shown in drawing 4, in a digital still camera 2, the IP address of the device of the notified access origin is first recorded as a security means, and access hysteresis is managed. The recorded access hysteresis gives an indication possible as an access hysteresis chart 210. Moreover, the IP address of the device which permits connection is beforehand memorized as an IP address list 220, and access restriction is performed so that it may not connect with the device which holds IP addresses other than this. Moreover, access restriction is performed by requiring the input of a password 230 from the accessed device besides use of such an IP address.

[0036] First, a digital still camera 2 carries out sequential record of the IP address which the device of the access origin notified in received data holds as a function of the WWW server processing section 23. And it is possible to output by using this access hysteresis as the access hysteresis chart 210 by displaying on a display 24, and transmitting and printing to other PCs etc.

[0037] Here, the example of a screen display of the access hysteresis chart 210 is shown in drawing 5. As shown in drawing 5, in the access hysteresis chart 210, sequential record of the IP address of the device of the date and time amount, and access origin extracted from the inside of transmit data is carried out. [which were accessed] Such access hysteresis enables it to specify the device of an access place, when there is unjust access.

[0038] Moreover, access hysteresis may be recorded for every [not the time of connection but] image data. For example, if click actuation to file name 32a of the image data in this screen is performed when the homepage screen 32 as shown in drawing 3 is displayed on the device of an access place, the WWW server processing section 23 will detect this click actuation, will be made to correspond to the file name of the specified image data, and will record the IP address of the device of an access place with time. By this, the user of a digital still camera 2 becomes possible [also getting to know the access situation for every image].

[0039] Next, when performing access restriction using the IP address of the device of an accessing agency, the WWW server processing section 23 memorizes beforehand the IP address of the device which permits connection as an IP address list 220. And connection is permitted, only when there was access from a device, the IP address of the device of an accessing agency is extracted out of transmit data and the same IP address exists as compared with the IP address list 220. Moreover, when not permitting connection, it notifies that transmitted the predetermined HTTP file and connection went wrong. It becomes impossible to connect only a specific device with a digital still camera 2 by this.

[0040] Moreover, this IP address list 220 may be set up for every image data. For example, in a homepage screen 32 like drawing 3, when click actuation of one of the file name 32a is carried out, connection authorization is judged with reference to the IP address list 220. Moreover, when file name 32a is arranged according to items, such as "Mt. Fuji" and "Tokyo Bay", like the homepage screen 32 of drawing 3, the IP address list 220 is set up for every item of this, and it may be made to judge

connection authorization. Thus, it becomes possible by limiting a device connectable for every item for every image data and arrangement to exhibit a required image to the user of a specific device.

[0041] Next, when performing access restriction using a password, the WWW server processing section 23 memorizes the password 230 for permitting connection beforehand. And if there is access, for example from video display terminal 3a, a predetermined HTML file will be transmitted to an access place, and it will ask for the input of a password.

[0042] Here, the example of the input screen of the password 230 in video display terminal 3a is shown to drawing 6. As shown in drawing 6, in video display terminal 3a which accessed the digital still camera 2, the input window 33 for entering a password 230 into the browser screen 31 is displayed in a monitoring device. When a password 230 is entered in the input window 33 by the user of video display terminal 3a and click actuation to transmitting carbon button 33a is performed, it is transmitted to a digital still camera 2, and the inputted data of a character string are compared with the password 230 memorized beforehand. When the input string is in agreement with a password 230 with this comparison, for example, when the HTML file which displays a homepage screen 32 like drawing 3 is transmitted and it is not in agreement, it is notified that the predetermined HTTP file was transmitted and connection went wrong. Thereby, only a specific person becomes possible [connecting with a digital still camera 2 and perusing an image].

[0043] Moreover, access restriction with such a password 230 as well as the case where the IP address mentioned above is used can be set up for every item for every image data and arrangement. It enables this to limit the person who can peruse for every image.

[0044] About the IP address and password 230 which are set up about whether access restriction which used above IP addresses or passwords 230 is carried out, it is possible to set it as arbitration by the user of a digital still camera 2.

[0045] Next, drawing 7 is a flow chart which shows the example of processing in the WWW server processing section 23 when being accessed from video display terminal 3a. In step S701, the data of the connection request transmitted from video display terminal 3a are received through communication link I/F25. In step S702, the IP address of data transmitting origin is extracted from the received data, and it records on the IP address list 220 with the time at this time.

[0046] In step S703, when being set up so that access restriction which used the IP address may be performed, it progresses to step S704, and when not set up in this way, it progresses to step S706. In step S704, it judges whether with reference to the IP address list 220 which recorded the IP address to which connection is permitted, the IP address of the data transmitting origin extracted from the received data exists in this. When it exists, it progresses to step S710, and when it does not exist, it progresses to step S705.

[0047] In step S705, while video display terminal 3a of an accessing agency is judged to be the device which has not permitted connection, transmits a predetermined HTTP file and notifies a connection refusal, connection with video display terminal 3a is cut.

[0048] Moreover, in step S706, when being set up so that access restriction with a password 230 may be carried out, it progresses to step S707, and when not set up in this way, it progresses to step S710. In step S707, the HTML file for displaying the screen into which a password 230 is made to enter is transmitted. In step S708, the data containing the character string inputted in video display terminal 3a are received, and it judges whether it is in agreement with the password 230 set up beforehand. When in agreement, it progresses to step S710, and when not in agreement, it progresses to step S709.

[0049] In step S709, while video display terminal 3a of an accessing agency is judged to be the device which has not permitted connection, transmits a predetermined HTTP file and notifies a connection refusal, connection with video display terminal 3a is cut.

[0050] Moreover, when the IP address extracted from received data exists during the IP address list 220 at step S704, when access restriction which used the password 230 with the access restriction using an IP address at step S706 is not carried out, either, or when the transmitted character string is in agreement with a password 230 at step S708, it means that connection was permitted. Therefore, in step S710, the HTML file on which the initial screen for image public presentation is displayed is transmitted. When

the thumbnail image of the image which can be perused to the inside at this time, for example, the display screen, is included, the data of the thumbnail image beforehand generated from the image data recorded on memory card 22a are transmitted with an HTML file.

[0051] In step S711, according to the data transmitted from video display terminal 3a, required image data is read from memory card 22a, and sequential transmission is carried out with the predetermined HTTP file memorized in the WWW server processing section 23. This becomes possible in video display terminal 3a to peruse the image recorded on the digital still camera 2.

[0052] In the above image public presentation system 1, since a digital still camera 2 can be operated as an image public presentation server on the Internet 4 when a digital still camera 2 holds an IP address, the user of a digital still camera 2 becomes possible [opening easily the image which he picturized to many general users through the Internet 4, without spending time and effort and time amount].

[0053] Moreover, video display terminals [which were connected to the Internet 4 with the digital still camera 2 / 3a-3n] each holds an IP address, and according to it being possible to carry out direct continuation to a digital still camera 2, a digital still camera 2 recognizes a video display terminals [of an accessing agency / 3a-3n] IP address, and becomes possible [providing security means, such as prevention of unlawful access, using this]. Moreover, the IP address of an accessing agency is used with this, and it becomes possible to open a specific image only to a specific device.

[0054] In addition, although the example of a gestalt of the above-mentioned operation explained the system which exhibits an image pick-up image by the Internet 4, you may make it open to the public, for example using other networks, such as LAN (Local Area Network). The picturized image data can be exhibited by assigning an IP address like the above to digital still camera 2 the very thing also in this case, and performing a peer to peer communication link with video display terminals 3a-3n.

[0055] Moreover, although the example of a gestalt of the above-mentioned operation showed the case where a homepage was used as an approach of exhibiting an image on the Internet 4, original communication service other than WWW may be built not only among this but among a digital still camera 2 and each video display terminals 3a-3n. The software of dedication is made to carry in a digital still camera 2 and video display terminals 3a-3n in this case, respectively, and it receives [are and] it made to transmit data by performing the communication link according to Internet Protocol.

[0056] Moreover, although the example of a gestalt of the above-mentioned operation showed the case where this invention was applied to a digital still camera 2, it is applicable also to image data-logging regenerative apparatus, such as VTR which mainly records dynamic-image data, the image data-logging regenerative apparatus with a camera device generally called a camcorder as other image pick-up equipments, for example. In order to record image data in these cases, it is desirable to use record media, such as a possible hard disk of random access.

[0057]

[Effect of the Invention] It becomes possible to receive direct access from an external device through a network by holding the IP address with the image pick-up equipment of this invention, as explained above, and according to the Request to Send of image data transmitted to addressing to an IP address held with an image public presentation server means, predetermined image data is read from an image data-logging means, and it becomes possible to transmit through a network. Therefore, the picturized image can be easily exhibited through a network.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the image recording regenerative apparatus in which record and playback of the image pick-up equipment which picturizes and records an image, and image data are possible.

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PRIOR ART

[Description of the Prior Art] Image pick-up equipments, such as a digital still camera which an image is photoed and can be memorized as digital data in recent years, and a camcorder, have spread. For example, the memory card which is removable small semiconductor memory is made to usually memorize the photoed image data in a digital still camera. Moreover, development of image regeneration equipments, such as memorizable digital VTR (video tape recorder), is also progressing by using as digital data the dynamic image obtained by reception, an external input, etc. of broadcast. [0003] Moreover, it is also general using networks, such as the Internet, to perform an electronic mail, perusal of a homepage, etc. In the current Internet, although IPv4 (Internet Protocol version 4) is mainly used as a communications protocol, problems, such as lack of an address space, have arisen with the rapid growth of the Internet. Then, maintenance of IPv6 (IP version 6) is advanced as a communications protocol of the next generation which has a 128-bit huge address space.

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EFFECT OF THE INVENTION

[Effect of the Invention] It becomes possible to receive direct access from an external device through a network by holding the IP address with the image pick-up equipment of this invention, as explained above, and according to the Request to Send of image data transmitted to addressing to an IP address held with an image public presentation server means, predetermined image data is read from an image data-logging means, and it becomes possible to transmit through a network. Therefore, the picturized image can be easily exhibited through a network.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, the demand of wanting to open the image photoed with the above image pick-up equipments to many general users through a network is increasing. In order to exhibit the photoed image through a network conventionally, generally the photoed image data needed to be transmitted to the Network Server. For example, although there is the approach of using a homepage as an approach of exhibiting through the Internet, once transmitting image data to PC (personal computer) etc. from image pick-up equipment in this case, it is necessary to transmit to the WWW (World Wide Web) server which ISP (Internet Service Provider) which offers communication service possesses.

[0005] If the case where it opens to the public on a homepage is explained concretely hereafter, after a memory card memorizes, by using the communication interface which extracted this memory card, and put to PC etc., or was prepared in image pick-up equipment etc., the image data generated by photography by image pick-up equipment will be transmitted in PC, and will be memorized by storage, such as a hard disk. And the data of the HTML (Hypertext Markup Language) format containing the image data which accessed ISP and was photoed through the telephone line etc. from this PC are created, and a WWW server is made to memorize. Thereby, a general user becomes possible [perusing image data in a browser screen] by specifying URL (Uniform Resource Locators), accessing this WWW server, and reading an HTML document.

[0006] Thus, since image data had to be incorporated to PC etc. in order to exhibit the photoed image on a network conventionally, and it had to transmit to the Network Server, by the time the photoed image was exhibited, time and effort and time amount start and were troublesome.

[0007] Moreover, not only image pick-up equipment but when the image data recorded in image recording regenerative apparatus, such as digital VTR, was exhibited through a network, there was instead of [no] in performing data transfer to PC or ISP.

[0008] This invention is made in view of such a technical problem, and it aims at offering the image pick-up equipment which can exhibit image data easily through a network.

[Translation done.]

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MEANS

[Means for Solving the Problem] In the image pick-up equipment which picturizes and records an image in order to solve the above-mentioned technical problem in this invention An image data-logging means to hold an IP address and to record the picturized image as image data of a digital method, If the Request to Send of said image data which connected with the network and was transmitted to said addressing to an IP address through said network is received Said predetermined image data is read from said image data-logging means, and the image pick-up equipment characterized by having an image public presentation server means to transmit through said network is offered.

[0010] It becomes possible to receive direct access from an external device through a network by holding the IP address with such image pick-up equipment, and according to the Request to Send of image data transmitted to addressing to an IP address held with an image public presentation server means, predetermined image data is read from an image data-logging means, and it becomes possible to transmit through a network. Therefore, the image picturized and recorded can be easily exhibited through a network.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. In addition, the example of a gestalt of the following operations explains the case where the image pick-up equipment of this invention is applied to a digital still camera. Drawing 1 is drawing showing the example of a system configuration of the image public presentation system containing a digital still camera.

[0012] The image public presentation system 1 shown in drawing 1 is constituted by two or more video display terminals 3a-3n for displaying the digital still camera 2 which picturizes and records an image, and the image exhibited by the digital still camera 2. A digital still camera 2 and each video display terminals 3a-3n are connected through the Internet 4. This image public presentation system 1 is picturized in a digital still camera 2, and is a system for opening the recorded image data to video display terminals 3a-3n through the Internet 4.

[0013] A digital still camera 2 picturizes a photographic subject, and records a static image on the Lord who picturized as image data of a digital method. This image data is recorded on the memory card which is removable small semiconductor memory, for example. Moreover, a digital still camera 2 has a function as an image public presentation server for exhibiting the recorded image data through the Internet 4.

[0014] Moreover, video display terminals 3a-3n are information processors, such as PC and PDA (Personal Digital Assistants), and possess the function for displaying the required processing facility for communicating with a digital still camera 2 through the Internet 4, and the received image etc.

[0015] These digital still camera 2 and video display terminals 3a-3n are connected with the Internet 4 through communication wires, such as the telephone line and Ethernet (trademark), from ISP which was prepared on the Internet 4 and which is not illustrated in fact. In this case, each equipment possesses the modem for connecting with the telephone line, NIC (Network Interface Card) for connecting with Ethernet, etc. Moreover, when the communications protocol of communication link I/F which a digital

still camera 2 possesses, for example differs from the communications protocol for connecting with ISP, the gateway is prepared among these, it is changing a communications protocol and a mutual communication link is attained.

[0016] In this image public presentation system 1, each a digital still camera 2 and video display terminals [3a-3n] equipment holds the IP address based on IPv6. Between each equipment, a communication link is performed according to Internet Protocol (IP), and it becomes possible by specifying the IP address of a transmission place to transmit data to the target transmission place. In IPv6, a huge address space can be obtained by specifying an IP address as 128-bit data. Thereby, to a digital still camera 2 and video display terminals [3a-3n] each which was installed in domestic, a global IP address can be assigned and the peer to peer communication link between these equipments is attained.

[0017] Therefore, it can be made to function as a server for offering the communication service on the Internet 4 about both a digital still camera 2 or the video display terminals 3a-3n. Moreover, ISP does not need to possess the server ability for offering the communication service on the Internet 4 fundamentally that what is necessary is to offer only the service which makes connection with the communication wire and the Internet 4 which tie each equipment.

[0018] For example, when exhibiting on a homepage the image picturized in the digital still camera 2 using the technique of WWW, WWW server ability can be prepared in the digital still camera 2 instead of ISP. Video display terminals 3a-3n perform the browser program for perusing a homepage, are performing the communication link according to HTTP (Hypertext Transfer Protocol), and become possible [displaying the contents containing the image data offered from a digital still camera 2].

[0019] Thus, in this invention, the picturized image can be operated as an image public presentation server for opening to the public on the Internet 4 by having given the IP address to the digital still camera 2, and having made it possible to carry out direct access from other devices, such as video display terminals 3a-3n. Therefore, the user who picturized the image using the digital still camera 2 becomes possible [opening to the public easily through the Internet 4, without spending time and effort and time amount], without transmitting the recorded image data to the Network Server on devices, such as other PCs, or ISP.

[0020] Next, the example at the time of using a homepage is concretely explained as an approach of exhibiting the image picturized in the digital still camera 2. Drawing 2 is the block diagram showing the example of an internal configuration of the digital still camera 2 in this case.

[0021] As shown in drawing 2, a digital still camera 2 The camera section 21 which picturizes a photographic subject and generates the image data of a digital method, The image recording section 22 which records the generated image data, and the WWW server processing section 23 for exhibiting the picturized image on the Internet 4, It is constituted by communication link I/F (interface)25 for connecting with the display 24 which displays the homepage for exhibiting the image and image which were picturized etc. in the network of Internet 4 grade.

[0022] The camera device sections, such as CCD (Charge Coupled Device) for the camera section 21 to picturize a photographic subject, and a lens, a diaphragm device, The signal-processing section, an image memory, etc. which change the picture signal outputted into digital data, perform various image quality amendment processings and data compressions, and generate the image data of a predetermined data format are provided. While outputting the image data for record to the image recording section 22, the image data for a display to which processing of a data compression etc. is not performed is outputted to a display 24.

[0023] The image recording section 22 is constituted by the reader writer which performs writing to memory card 22a which is removable small semiconductor memory, and read-out, and records the image data outputted from the camera section 21 on memory card 22a, and reads and transmits predetermined image data to the WWW server processing section 23.

[0024] The WWW server processing section 23 memorizes the HTML file which constitutes a homepage, and transmits the HTML file for exhibiting the image which read and picturized image data to the Internet 4 through communication link I/F25 if needed according to the Request to Send which

received through communication link I/F25 from the image recording section 22. Moreover, the image data of the homepage constituted by this HTML file is transmitted to a display 24. Furthermore, processing which manages the access hysteresis from other devices through the Internet 4, and processing for restricting access are performed.

[0025] A display 24 displays the picturized image, the image of a homepage, etc. on LCD (liquid crystal display) according to the image data transmitted from the camera section 21 or the WWW server processing section 23.

[0026] It connects with a communication wire from ISP linked to the Internet 4, and communication link I/F25 transmits and receives the data of this communication wire and the WWW server processing section 23. This communication link I/F25 communicates for example, based on USB (Universal Serial Bus) specification. In this case, communication link I/F25 is connected through the gateway which is not illustrated, for example to the telephone line from ISP, or the communication wire by Ethernet. While this gateway possesses the Ethernet adapter for connecting with the modem or Ethernet for connecting with the telephone line, and the I/F section for connecting with the communication wire of USB specification and changes a communication link format The IP address specified through the Internet 4 is recognized, and access to a digital still camera 2 is enabled, and assignment of the IP address by the digital still camera 2 is recognized, and processing for enabling access to the device on the Internet 4 is performed.

[0027] In addition, for example, telecommunications standards, such as wireless LAN and Bluetooth, may be used between this gateway, and it may be made to connect them by wireless without a cable. In this case, communication link I/F25 possesses the antenna for transmitting and receiving data by wireless etc.

[0028] In such a digital still camera 2, when picturizing an image, in the camera device section of the camera section 21, incidence of the light from a photographic subject is carried out to CCD, photo electric conversion is carried out to it, and a picture signal is outputted. After being changed into digital data in the signal-processing section and performing image quality amendment processing of noise reduction etc., this picture signal is changed into the predetermined data format for a display, and is sent out to a display 24. A display 24 displays the image currently picturized on LCD according to the image data which received.

[0029] If record of an image is required [that the shutter carbon button which is not illustrated is pushed in this condition, etc. and], the signal-processing section of the camera section 21 changes the picture signal for one frame at this time into data formats, such as JPEG for record (Joint Photographic coding Experts Group), and sends it out to the image recording section 22. The image recording section 22 makes the image data which received record on the predetermined address in memory card 22a.

[0030] Moreover, by communication link I/F25, when exhibiting the image data picturized and recorded through the Internet 4, if access from video display terminal 3a is received, the WWW server processing section 23 reads a predetermined HTTP file, and sends it out to video display terminal 3a while it permits connection and notifies it to video display terminal 3a. The picturized image can be exhibited to the user of video display terminal 3a by making predetermined image data read from memory card 22a [at this time 22, for example, the image recording section,], and associating and transmitting this image data in a HTTP file. Moreover, the list of the file names of the image data opened to a HTTP file is carried, and you may make it transmit image data by clicking the file name of a video display terminal 3a small lever. For that, CGI (Common Gateway Interface), the crickable map function carried in the browser program by the side of video display terminal 3a are used.

[0031] Here, drawing 3 is drawing showing the example of a screen display in video display terminal 3a which accessed the digital still camera 2. In video display terminal 3a, the browser screen 31 as shown in drawing 3 by performing a browser program is displayed, and if connection with a digital still camera 2 is successful and a HTTP file is received, the homepage screen 32 by the HTTP file which received will be displayed into this browser screen 31. It is displayed as an initial screen immediately after access, and file name 32a of the image data recorded on memory card 22a of a digital still camera 2 is arranged for every items, such as "Mt. Fuji" and "Tokyo Bay", and the homepage screen 32 shown in

this drawing 3 is displayed. Moreover, it is shown that it can link to each file name 32a with an underline, and the specified image data can be downloaded and displayed by carrying out click actuation of this file name 32a. Furthermore, the thumbnail image which reduced the display size of the image recorded with file name 32a may be displayed, and you may constitute so that a visitor may understand the contents of the image.

[0032] The HTTP file for constituting a homepage screen 32 like a WWW server processing section 23 smell lever from a digital still camera 2 is generated. You may make it for example, memory card 22a's storage of image data generate this HTTP file automatically in the WWW server processing section 23. Moreover, the homepage screen generated by the HTTP file may be displayed on a display 24, and the WWW server processing section 23 may possess the program which enables edit of the contents of a display according to the input of the user by the actuation input section which is not illustrated. By such approach, the user of a digital still camera 2 becomes possible [generating the open screen of image data easily], without transmitting the picturized image data to other devices, such as PC.

[0033] By the way, since direct continuation is carried out through a device and the Internet 4, such as video display terminals 3a-3n, it will be saved at the WWW server processing section 23, memory card 22a, etc., and the linked HTTP file and image data will be altogether shared between a digital still camera 2 with other connected devices. Then, since unjust access is prevented or only an image to exhibit is transmitted, it is necessary to provide a security means.

[0034] Here, drawing 4 is drawing for explaining notionally the security means in a digital still camera 2. In the digital still camera 2, since the communication link with an external device is performed according to Internet Protocol, when accessed from these devices, the IP address which the device of an accessing agency holds is recorded into the data transmitted from this device. Therefore, in a digital still camera 2, the notified IP address is used as a security means.

[0035] As shown in drawing 4, in a digital still camera 2, the IP address of the device of the notified access origin is first recorded as a security means, and access hysteresis is managed. The recorded access hysteresis gives an indication possible as an access hysteresis chart 210. Moreover, the IP address of the device which permits connection is beforehand memorized as an IP address list 220, and access restriction is performed so that it may not connect with the device which holds IP addresses other than this. Moreover, access restriction is performed by requiring the input of a password 230 from the accessed device besides use of such an IP address.

[0036] First, a digital still camera 2 carries out sequential record of the IP address which the device of the access origin notified in received data holds as a function of the WWW server processing section 23. And it is possible to output by using this access hysteresis as the access hysteresis chart 210 by displaying on a display 24, and transmitting and printing to other PCs etc.

[0037] Here, the example of a screen display of the access hysteresis chart 210 is shown in drawing 5. As shown in drawing 5, in the access hysteresis chart 210, sequential record of the IP address of the device of the date and time amount, and access origin extracted from the inside of transmit data is carried out. [which were accessed] Such access hysteresis enables it to specify the device of an access place, when there is unjust access.

[0038] Moreover, access hysteresis may be recorded for every [not the time of connection but] image data. For example, if click actuation to file name 32a of the image data in this screen is performed when the homepage screen 32 as shown in drawing 3 is displayed on the device of an access place, the WWW server processing section 23 will detect this click actuation, will be made to correspond to the file name of the specified image data, and will record the IP address of the device of an access place with time. By this, the user of a digital still camera 2 becomes possible [also getting to know the access situation for every image].

[0039] Next, when performing access restriction using the IP address of the device of an accessing agency, the WWW server processing section 23 memorizes beforehand the IP address of the device which permits connection as an IP address list 220. And connection is permitted, only when there was access from a device, the IP address of the device of an accessing agency is extracted out of transmit data and the same IP address exists as compared with the IP address list 220. Moreover, when not

permitting connection, it notifies that transmitted the predetermined HTTP file and connection went wrong. It becomes impossible to connect only a specific device with a digital still camera 2 by this.

[0040] Moreover, this IP address list 220 may be set up for every image data. For example, in a homepage screen 32 like drawing 3, when click actuation of one of the file name 32a is carried out, connection authorization is judged with reference to the IP address list 220. Moreover, when file name 32a is arranged according to items, such as "Mt. Fuji" and "Tokyo Bay", like the homepage screen 32 of drawing 3, the IP address list 220 is set up for every item of this, and it may be made to judge connection authorization. Thus, it becomes possible by limiting a device connectable for every item for every image data and arrangement to exhibit a required image to the user of a specific device.

[0041] Next, when performing access restriction using a password, the WWW server processing section 23 memorizes the password 230 for permitting connection beforehand. And if there is access, for example from video display terminal 3a, a predetermined HTML file will be transmitted to an access place, and it will ask for the input of a password.

[0042] Here, the example of the input screen of the password 230 in video display terminal 3a is shown to drawing 6. As shown in drawing 6, in video display terminal 3a which accessed the digital still camera 2, the input window 33 for entering a password 230 into the browser screen 31 is displayed in a monitoring device. When a password 230 is entered in the input window 33 by the user of video display terminal 3a and click actuation to transmitting carbon button 33a is performed, it is transmitted to a digital still camera 2, and the inputted data of a character string are compared with the password 230 memorized beforehand. When the input string is in agreement with a password 230 with this comparison, for example, when the HTML file which displays a homepage screen 32 like drawing 3 is transmitted and it is not in agreement, it is notified that the predetermined HTTP file was transmitted and connection went wrong. Thereby, only a specific person becomes possible [connecting with a digital still camera 2 and perusing an image].

[0043] Moreover, access restriction with such a password 230 as well as the case where the IP address mentioned above is used can be set up for every item for every image data and arrangement. It enables this to limit the person who can peruse for every image.

[0044]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the example of a system configuration of the image public presentation system containing a digital still camera.

[Drawing 2] It is the block diagram showing the example of an internal configuration of the digital still camera in the case of exhibiting the picturized image using a homepage.

[Drawing 3] It is drawing showing the example of a screen display in the video display terminal which accessed the digital still camera.

[Drawing 4] It is drawing for explaining the security means in a digital still camera notionally.

[Drawing 5] It is drawing showing the example of a screen display of an access hysteresis chart.

[Drawing 6] It is drawing showing the example of a display of the input screen of the password in the video display terminal which accessed the digital still camera.

[Drawing 7] It is the flow chart which shows the example of processing in the WWW server processing section when being accessed from a video display terminal.

[Description of Notations]

1 [.. The Internet, 21 / .. The camera section, 22 / .. The image recording section, 22a / .. A memory card, 23 / .. The WWW server processing section 24 / .. A display, 25 / .. Communication link I/F]
An image public presentation system, 2 .. A digital still camera, 3a-3n .. A video display terminal, 4

[Translation done.]

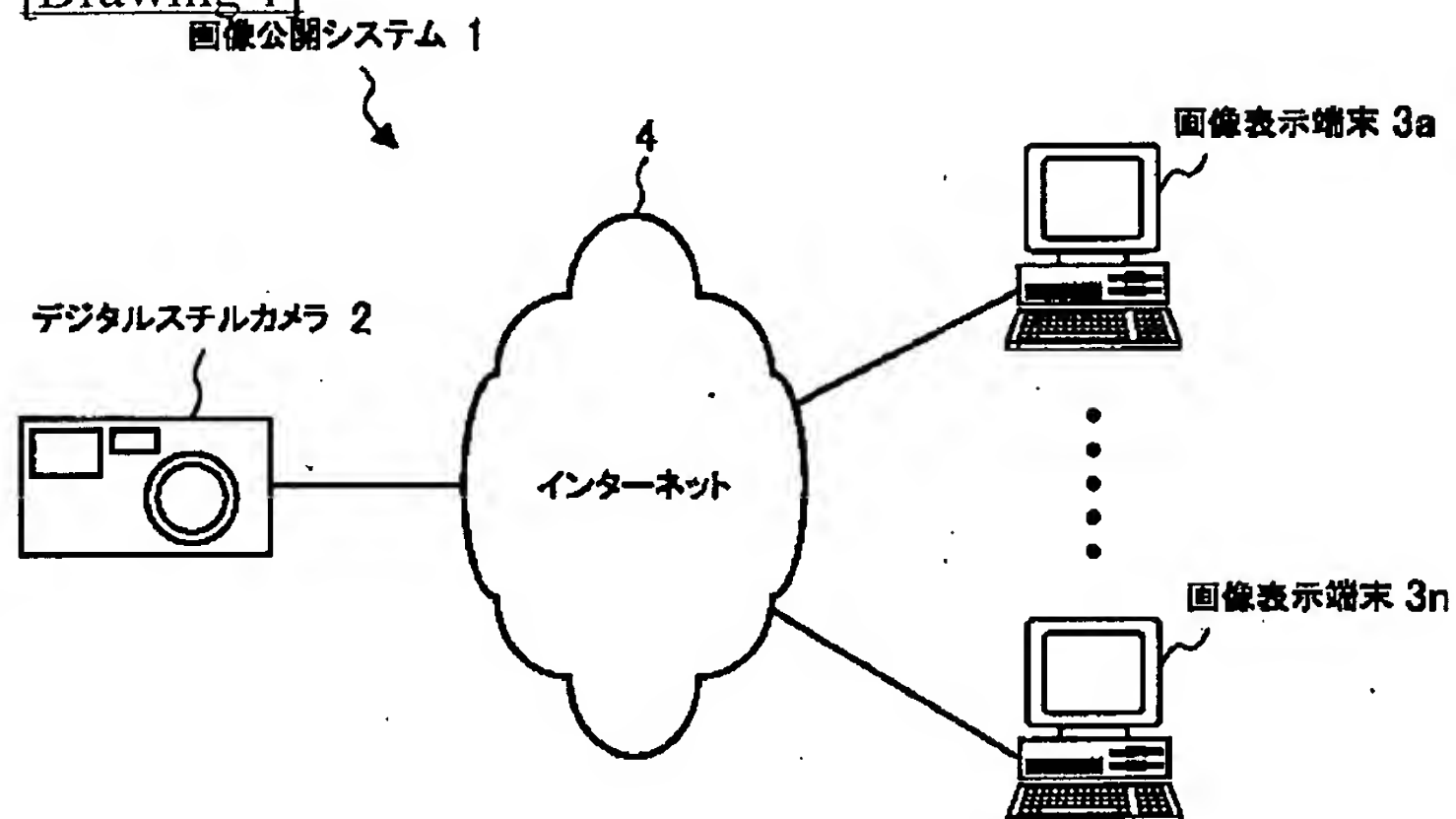
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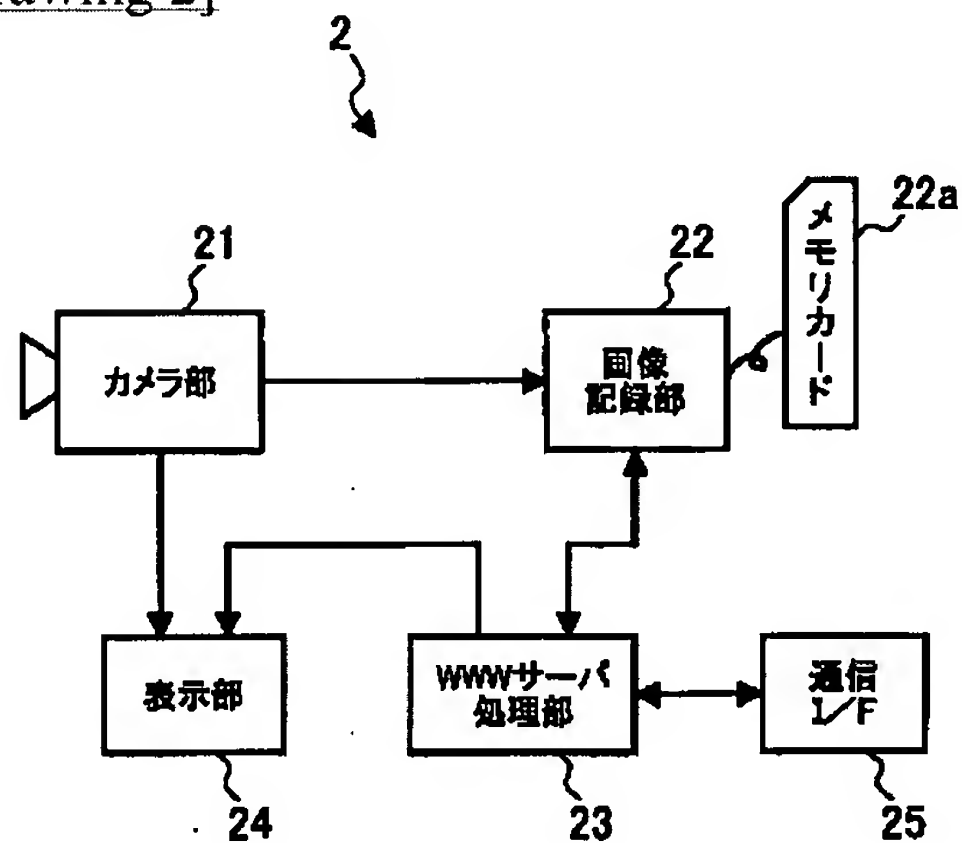
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DRAWINGS

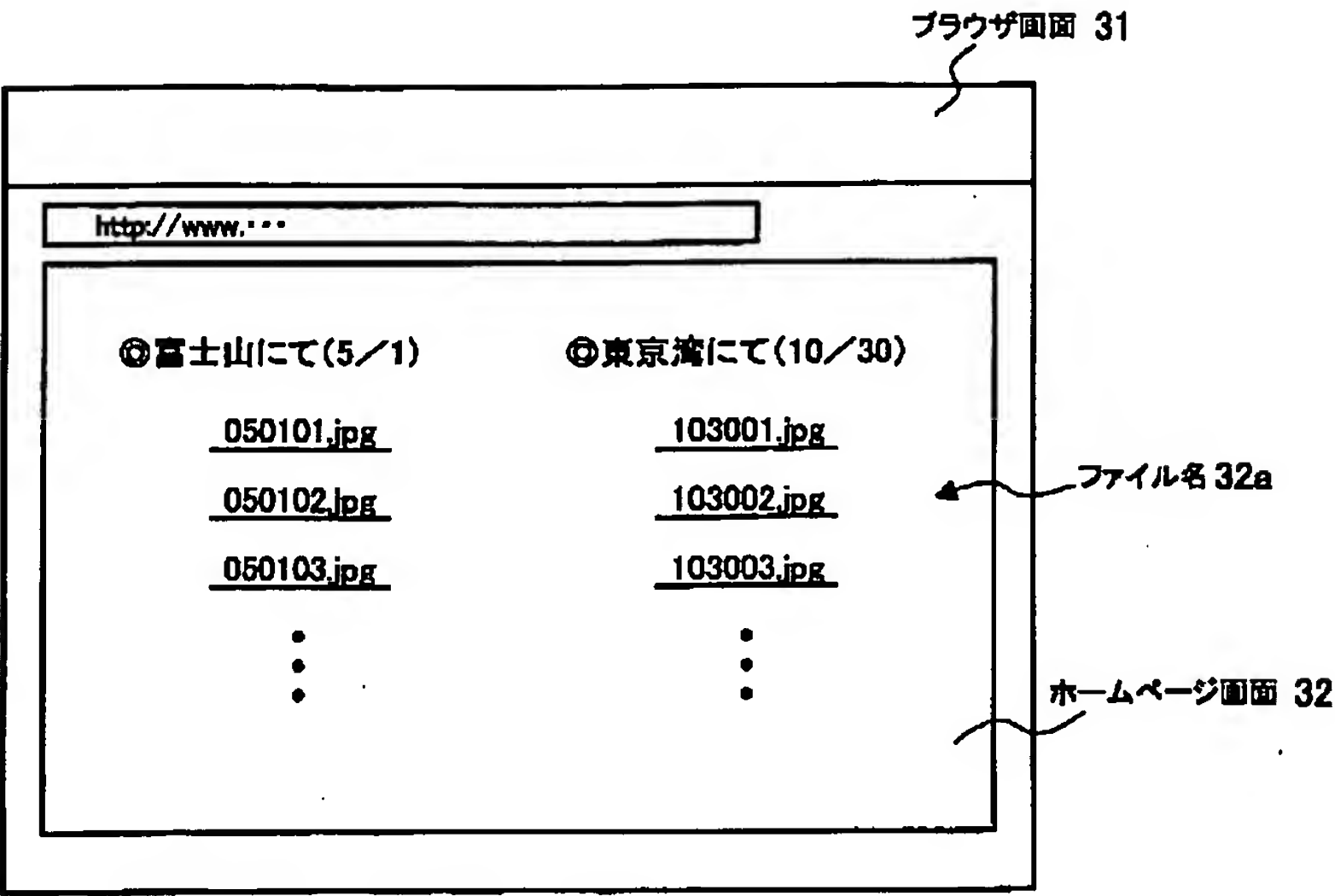
[Drawing 1]



[Drawing 2]



[Drawing 3]

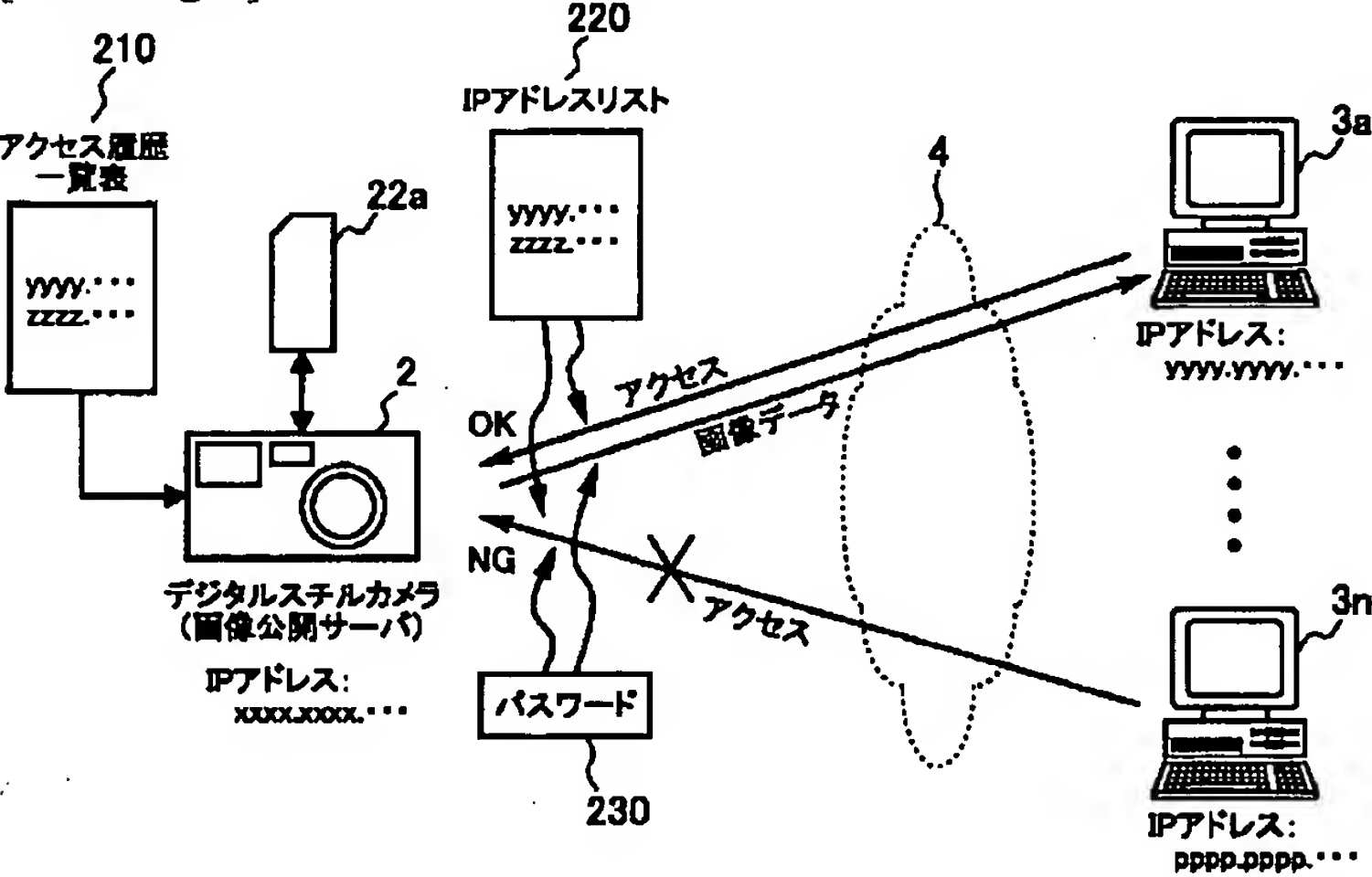


[Drawing 5]

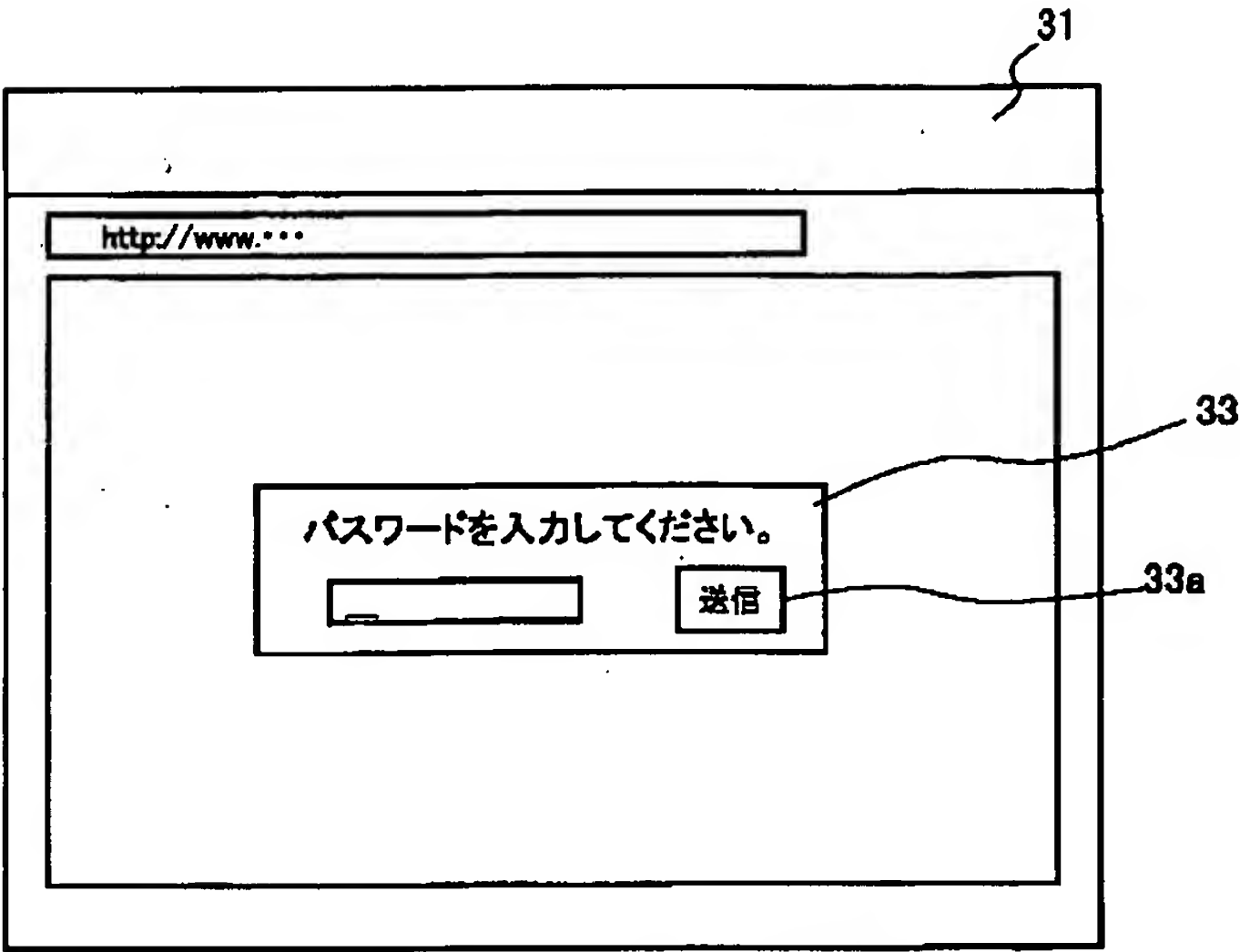
210

アクセス日時	IPアドレス
10. 01. 09:30	1080 : 0000 : ...
10. 01. 14:01	1080 : 0000 : ...
10. 14. 11:25	1092 : 0000 : ...
⋮	⋮

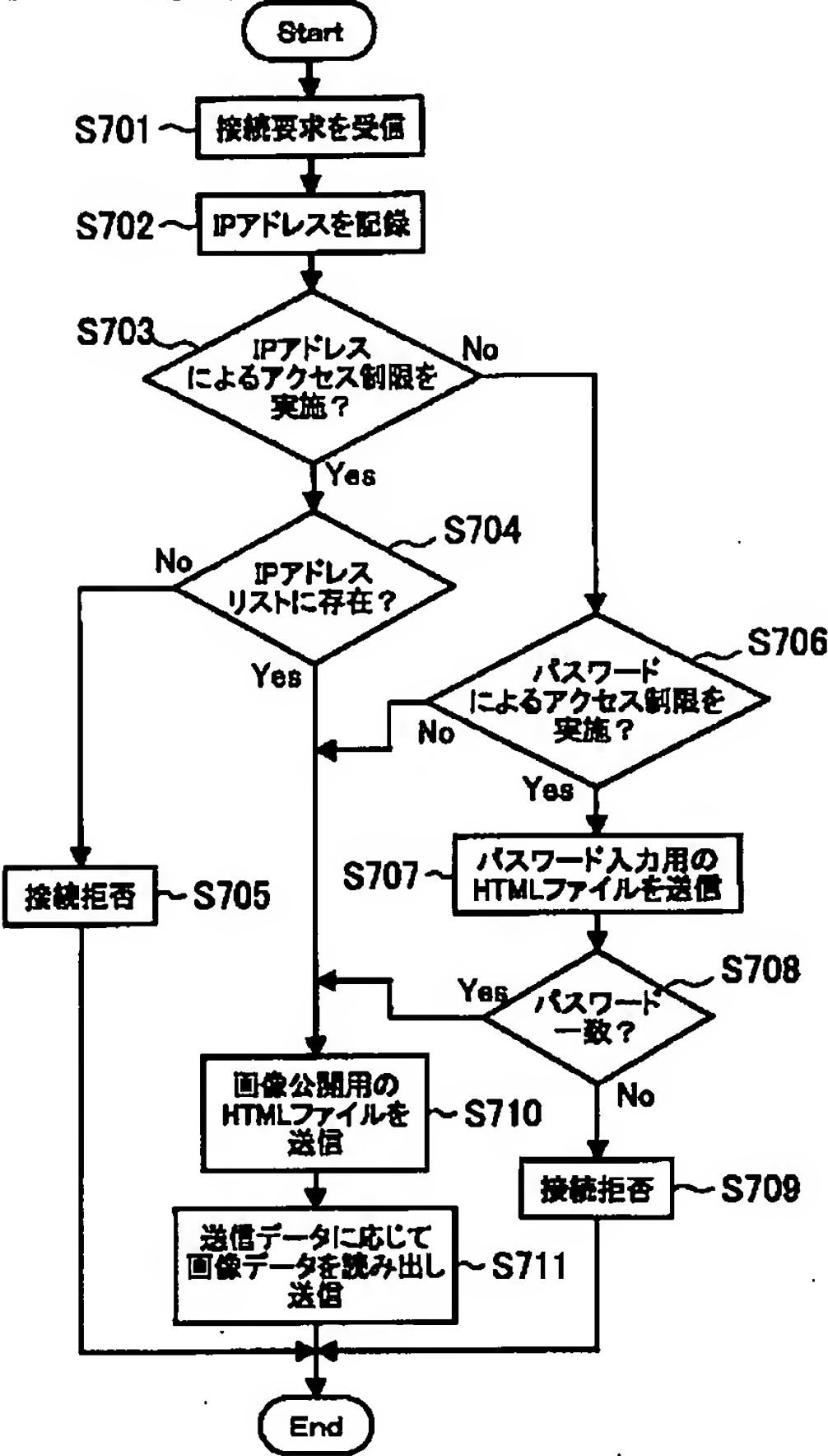
[Drawing 4]



[Drawing 6]



[Drawing 7]



[Translation done.]